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REMARKS

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 1, 3-18 and 20 are pending in the application.
Claims 1, 3-18 and 20 stand rejected.

Claim Rejections Under 35 USC §103

Claims 1 and 13 are rejected under 35 USC §103(a) as being unpatentable over Gilton et al '883 in view of Mullee '882 and Woo et al '166. It is contended that Gilton et al discloses a method and apparatus for detecting contaminating species on a wafer edge including the step of positioning a wafer in a container and adjusting the wafer's position such that a portion of the wafer is exposed to the volume of solvent. It is further contended that while Gilton et al does not recite the steps of providing a rotatable shaft attached to a bearing mounted in a support structure of adjustable height, mounting the wafer and positioning the wafer vertically and adjusting the bearings such that only the edge portion of the wafer is exposed to the solvent. The Examiner contended that it is well known in the art that the edge portion of a wafer is the section most frequently being contaminated.

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It is still further contended that Mullee discloses a method for detecting contaminating species on a wafer edge. While admitting "Gilton et al as modified by Mullee do not recite the steps of providing a rotatable shaft attached to a bearing mounted in a support structure of adjustable height", the Examiner reasoned that Woo et al shows in Figs. 6-10 a method and apparatus for handling semiconductor wafer by providing a rotatable shaft and further, that the limitation of adjustable height is inherent in Woo's. The Examiner further drew the conclusion that rotating a wafer "horizontally" (by Woo) means "vertically", if considered relative to the axis of the rotational shaft.

The rejection of claims 1 and 13 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al is respectfully traversed.

Gilton et al discloses a method and apparatus for analyzing a semiconductor surface by obtaining a sample from a localized section of a wafer section. A sample is obtained by isolating a section of the wafer with a sampling apparatus, dispensing liquid onto the isolated section of the wafer, dissolving compounds of interest in the liquid, removing a portion

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of the liquid and analyzing the liquid and dissolved compounds of interest. The sampling apparatus (page 2, paragraph 0027) includes "an outer tube 14 and a concentric inner tube 18. When a liquid 34 is introduced into the inner tube 18, the liquid 34 travels through the inner tube 18 and contacts a wafer surface 36 below the end of the inner tube 18. After the liquid 34 contacts the wafer surface 36, it dissolves in organic and/or organic materials on the wafer surface 36". (Page 2, paragraph 0029)

The Gilton et al's apparatus therefore does not perform the process step of the present invention method:

"positioning said wafer vertically in said container and adjusting a height of said bearing such that only a predetermined edge portion of the wafer is exposed to said volume of solvent;

rotating said wafer with said edge portion contacting said volume of solvent by turning said rotatable shaft".

Mullee discloses a method of purification of organic solvent fluids by passing the fluids through an ion-exchange media and thereby effecting the removal of undesirable impurities.

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The only reference that Mullee made regarding a semiconductor wafer is in paragraph 0004, page 1:

"Organic solvent fluids of various compositions are used to clean, develop, rinse, and dry wafers; prime surfaces; remove edge deposits; strip photoresist; and deposit dielectric materials".

Such statement is nothing more than a general comment on the many possible uses of organic solvents. As such, Mullee does not teach or disclose the present invention method and apparatus for collecting contaminating samples from a wafer edge and then analyzing the contaminants, let alone a method in which "only a predetermined edge portion of the wafer is exposed to a volume of solvent".

Woo et al discloses a rotating apparatus for holding a wafer under vacuum pressure, while the vacuum chuck horizontally rotates a semiconductor wafer (page 3, paragraph 0043). The Woo et al's apparatus rotates a wafer under an optical microscope for observation. While the Applicant does not dispute that a rotating stage is taught by Woo et al for rotating a wafer horizontally under an optical microscope for observation, the Applicant

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respectfully submits that the key elements of the present invention independent claims 1 and 13 regarding the control of a predetermined edge portion of a wafer exposed to a volume of solvent, is not taught or disclosed by Woo et al. For instance, the recitation in independent claim 1:

" positioning said wafer vertically in said container and adjusting a height of said bearing such that only a predetermined edge portion of the wafer is exposed to said volume of solvent;

rotating said wafer with said edge portion contacting said volume of solvent by turning said rotatable shaft."

Similarly in independent apparatus claim 13:

"a wafer mounting device for supporting a wafer over said container such that only a predetermined edge portion is exposed to said volume of solvent, said wafer mounting device further comprises ..."

These essential elements of the present invention are not taught or disclosed by Woo et al, and furthermore, are not taught or disclosed by Mullee and Gilton et al, either singularly or in combination thereof.

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The rejection of claims 1 and 13 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 3-5, 8 and 15-16 are rejected under 35 USC §103(a) as being unpatentable over Gilton et al as modified by Mullee and Woo et al.

The rejection of claims 3-5, 8 and 15-16 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al is respectfully traversed.

The Applicant has shown above that the essential elements of the present invention (as recited in independent claims 1 and 13, onto which claims 3-5, 8 and 15-16 depend) are clearly not taught or disclosed by Gilton et al, Mullee and Woo et al, either singularly or in combination thereof. The Examiner is respectfully invited to point out the paragraph numbers, or line numbers, in these references where the two key elements of

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controlling a predetermined edge portion of the wafer to be exposed to solvent, rotating the wafer with only the edge portion contacting the solvent, are taught or disclosed.

The rejection of claims 3-5, 8 and 15-16 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 6-7, 9, 14 and 17-18 are rejected under 35 USC §103(a) as being unpatentable over Gilton et al as modified by Mullee and Woo et al and further supplemented by common sense and general knowledge in the art.

The rejection of claims 6-7, 9, 14 and 17-18 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al is respectfully traversed.

As the Applicant has repeatedly emphasized, the key elements of the present invention as recited in independent claims 1 and 13, of "controlling a predetermined edge portion of the wafer to be exposed to the solvent" and "rotating the wafer with the edge

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portion contacting the solvent", are not taught or disclosed by the three references cited by the Examiner. Such deficiency in fulfilling the Examiner's obligation in supporting a §103(a) rejection by solid evidence is remedied by the Examiner with "common sense and general knowledge". The Applicant respectfully submits that such effort by the Examiner constitutes a classical "hind-sight reconstruction" of the present invention.

The rejection of claims 6-7, 9, 14 and 17-18 under 35 USC §103(a) based on Gilton et al, Mullee and Woo et al and common sense and general knowledge in the art is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicant respectfully submits that all of the pending claims, i.e. claims 1, 3-18 and 20, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

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In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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OCT 24 2003

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